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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/647,913	08/25/2003	Yisong Yu	2600.2.14	2332

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EXAMINER	
LEE, SIN J	

ART UNIT	PAPER NUMBER
1752	

DATE MAILED: 06/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/647,913	YU ET AL.	
	Examiner	Art Unit	
	Sin J. Lee	1752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-78* is/are pending in the application.

4a) Of the above claim(s) *42-44,52,60,68,76 and 78* is/are withdrawn from consideration.

5)☒ Claim(s) *41 and 77* is/are allowed.

6)☒ Claim(s) *1-11,21-31,45-51,53,61 and 69* is/are rejected.

7)☒ Claim(s) *12-20,32-40,54-59,62-67 and 70-75* is/are objected to.

8)☒ Claim(s) *1-78* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/6/04,9/22/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's election of the invention of Group I (claims 1-41, 45-51, 53-59, 61-67, 69-75, and 77) in the reply filed on March 15, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Claims 42-44, 52, 60, 68, 76, and 78 are withdrawn from consideration as not directed to the elected invention.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-8 and 45-49 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanaka et al (EP 0 949 088 A1).

Tanaka teaches (pg.3, lines 33-44) a heat sensitive lithoprinting original plate, which comprises a support and a hydrophilic layer comprising (i) fine particles which are converted to an image area by heat and (ii) a hydrophilic binder polymer containing a polyvalent metal ion and having a Lewis base portion containing nitrogen, oxygen or sulfur, wherein the hydrophilic binder is three-dimensionally cross-linked by the interaction between the polyvalent metal ion and the Lewis base portion. Tanaka subjects the original plate to printing in thermal mode to form an oleophilic image area in the hydrophilic layer.

As the fine particles of his hydrophilic layer, Tanaka teaches ([0060]) oleophilic resins, which are exposed onto the hydrophilic layer surface by the melt diffusion of the oleophilic resins due to the thermal mode printing, thereby forming an image area. Tanaka teaches that preferably, microencapsulated oleophilic component having such a structure that the internal oleophilic component (specific examples for the oleophilic component are listed in [0066]) and the hydrophilic layer are separated by a hydrophilic wall is used as the fine particles. Therefore, Tanaka teaches present thermally softenable hydrophobic polymer and present hydrophilic polymer.

Furthermore, Tanaka teaches ([0064] and [0081]) that in order to enhance the plate wear, it is preferable that the oleophilic component has also a crosslinked structure and that a reactive material such as compounds having plurality of hydroxyl groups, amino groups and carboxyl groups, *for example, polyvinyl alcohol, polyamine, polyacrylic acid, trimethylolpropane,* can be used for heightening the degree of cross-linking of the oleophilic component. Based on this teaching, one skilled in the art would immediately envisage using a compound having plurality of carboxyl groups such as polyacrylic acid (since there are only several examples are listed) in order to heighten the degree of crosslinking of Tanaka's oleophilic component. The compound having plurality of carboxyl groups such as polyacrylic acid teaches present bonding compound capable of chemically bonding to the hydrophobic polymer and to the hydrophilic polymer (see present specification, pg.11, last paragraph).

Tanaka teaches the use of a light-heat converting material (such as polymethine type coloring matter, phthalocyanine type coloring matter, dithiol metal complex salt

type coloring matter, anthraquinone type coloring matter, triphenylmethane type coloring matter, azo type disperse dye, intramolecular CT coloring matter and the like – these examples are also listed in present specification, pg.13) in his hydrophilic layer. Therefore, the prior art teaches present inventions of claims 1-8 and 45-49.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 9, 10, 21-30, 50, and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al (EP 0 949 088A1).

As discussed above in Paragraph 3, Tanaka teaches that his hydrophilic binder polymer contains a polyvalent metal ion and has a Lewis base portion containing nitrogen, oxygen or sulfur. Tanaka also teaches (pg.3, lines 55-58, pg.4, lines 1-5) that "the Lewis base portion containing nitrogen, oxygen or sulfur is at least one member selected from the group consisting of *amino group*, monoalkylamino group, dialkylamino group, trialkylamino group, . . . and morpholino group." Based on this teaching, it would have been obvious to one skilled in the art to have the amino group as the Lewis base portion of Tanaka's hydrophilic binder polymer with a reasonable expectation of obtaining a lithoprinting plate having a high plate wear and a high dimension accuracy. Therefore, Tanaka's teaching would render obvious present inventions of claims 9 and 50.

With respect to present claims 10 and 51, Tanaka states ([0015]) that "[a]s the hydrophilic binder polymer having a three-dimensional, cross-linked structure, there are mentioned a polymer which is comprises of carbon-carbon bonds or composed of carbon atoms or carbon-carbon bonds connected with at least one hetero atom selected from the group consisting of oxygen, nitrogen, sulfur and phosphor, for example, a polymer of poly(meth)acrylate type, . . . polyamine type, polysaccharide type or the like, and which has in its structure a Lewis base portion containing nitrogen, oxygen or sulfur and has been three-dimensionally cross-linked by the interaction between the Lewis base portion and the polyvalent metal ion; . . ." Based on Tanaka's teaching, it would have been obvious to one skilled in the art to use as the hydrophilic binder polymer a polymer of polyamine type or polysaccharide type, which has in its structure a Lewis base portion containing nitrogen, oxygen or sulfur and has been three-dimensionally cross-linked by the interaction between the Lewis base portion and the polyvalent metal ion, with a reasonable expectation of obtaining a lithoprinting plate having a high plate wear and a high dimension accuracy. Therefore, Tanaka's teaching would render obvious present inventions of claims 10 and 51.

With respect to present claims 21-24, 29, and 30, as discussed above, Tanaka states ([0015]) that "[a]s the hydrophilic binder polymer having a three-dimensional, cross-linked structure, there are mentioned a polymer which is comprises of carbon-carbon bonds or composed of carbon atoms or carbon-carbon bonds connected with at least one hetero atom selected from the group consisting of oxygen, nitrogen, sulfur and phosphor, for example, a polymer of poly(meth)acrylate type, . . . polyamine type,

polysaccharide type or the like, *and which has in its structure a Lewis base portion containing nitrogen, oxygen or sulfur* and has been three-dimensionally cross-linked by the interaction between the Lewis base portion and the polyvalent metal ion; . . ." Also, Tanaka teaches (pg.3, lines 55-58, pg.4, lines 1-5) that "the Lewis base portion containing nitrogen, oxygen or sulfur is *at least one member* selected from the group consisting of *amino group*, . . . *carboxyl group*, . . . and morpholino group." Based on Tanaka's teaching, it would have been obvious to one skilled in the art to use as the hydrophilic binder polymer a polymer of polyamine type or polysaccharide type, which has in its structure a Lewis base portion containing *amino group and carboxyl group* and has been three-dimensionally cross-linked by the interaction between the Lewis base portion and the polyvalent metal ion, with a reasonable expectation of obtaining a lithoprinting plate having a high plate wear and a high dimension accuracy. Therefore, Tanaka teaching renders obvious present copolymer of a hydrophilic polymer and a monomer that has a carboxylic group and thus renders obvious present inventions of claims 21-24, 29, and 30.

With respect to present claims 25-28, as discussed above in Paragraph 3, Tanaka teaches the use of a light-heat converting material (such as polymethine type coloring matter, phthalocyanine type coloring matter, dithiol metal complex salt type coloring matter, anthraquinone type coloring matter, triphenylmethane type coloring matter, azo type disperse dye, intramolecular CT coloring matter and the like – these examples are also listed in present specification, pg.13) in his hydrophilic layer. Therefore, the prior art teaches present inventions of claims 25-28.

6. Claims 11, 31, 53, 61, and 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida et al (US 6,821,556 B2).

Ishida teaches (col.2, lines 47-57) a process for producing a *heat-sensitive recording material* comprising (i) a support, (ii) a heat-sensitive recording layer comprising a leuco dye and a developer, (iii) an interlayer comprising a film-forming resin and formed on the heat-sensitive recording layer, and (iv) a protective layer comprising a resin in the form of a film and formed on the interlayer. In col.9, lines 5-20, Ishida states the following:

> Examples of film-forming resins which may be contained in the interlayer include at least one member selected from the group consisting of water-soluble resins and water-dispersible resins, such as fully saponified polyvinyl alcohol, partially saponified polyvinyl alcohol, carboxy-modified polyvinyl alcohols, acetoacetyl-modified polyvinyl alcohols, silicon-modified polyvinyl alcohols, diacetone-modified polyvinyl alcohols and like polyvinyl alcohols, as well as starches, hydroxyethyl cellulose, methyl cellulose, carboxymethyl cellulose, gelatin, casein, gum arabic, diisobutylene-maleic anhydride copolymer salts, styrene-maleic anhydride copolymer salts, ethylene-acrylic acid copolymer salts, styrene-acrylic acid copolymer salts, acrylic latex, and urethane latex. Of course, the invention is not limited to these, and they can be used in combinations of two or more.

Since Ishida teaches that the film-forming resins can be used in combinations of two or more, it would have been obvious to one of ordinary skill in the art to use the combinations of polyvinyl alcohol (a hydrophilic polymer) and styrene-acrylic acid copolymer (present copolymer of the hydrophobic monomer (styrene) and the bonding monomer (acrylic acid)) as the film-forming resins in the interlayer of Ishida's recording material with a reasonable expectation of obtaining a heat-sensitive recording material having excellent gloss and excellent sticking resistance and water resistance.

Therefore, Ishida's teaching would render obvious present inventions of claims 11, 31, 61, and 69.

With respect to present claim 53, Ishida also teaches (col.8, lines 63-67, col.9, lines 27-28) that the interlayer of his recording material can contain a pigment, and as examples for the pigment, Ishida includes (see col.6, lines 44-50) zinc oxide and titanium dioxide which are light-heat conversion materials. It would have been obvious to one skilled in the art to use zinc oxide or titanium dioxide as the pigment in the interlayer of Ishida's recording material with a reasonable expectation of obtaining a heat-sensitive recording material having excellent gloss and excellent sticking resistance and water resistance. Therefore, Ishida's teaching would render obvious present invention of claims 53.

Allowable Subject Matter

7. Claims 12-20, 32-40, 54-59, 62-67, and 70-75 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Ishida's heat-sensitive recording material makes use of the color forming reaction of a leuco dye with a developer induced by heat, and the reference does not teach or suggest present radiation-sensitive medium of claims 12, 22, 32, 54, 62, and 70 that is hydrophilic when coated and dried and becomes hydrophobic under the action of heat.

8. Claims 41 and 77 are allowed. None of the cited prior art teaches or suggests present hydrophilic polymer particles comprising chitosan.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333. The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Lee
June 9, 2005

SIN LEE
PRIMARY EXAMINER